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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/886,921

Applicant(s)

MYERS, MICHAEL H.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,9-12,19 and 20 is/are rejected.
- 7) ☒ Claim(s) 3-8 and 13-18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 9, 11, 12, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jopson (U.S. Patent No. 5,822,476).

Regarding claims 1 and 11, Jopson teaches an apparatus for optically storing information (Figure 1), the apparatus comprising: a first input line (e.g. input line between reference numeral 14 and reference numeral 16 in Figure 1) configured to transmit a first optical signal (e.g. signal 12 at $t=0$ as described in column 3 lines 64-67) and a second optical signal (e.g. signal 12 at $t=1$ as described in column 4 lines 1-4) at a first frequency (e.g. "particular frequency" of column 3 lines 49-50); a recirculating loop (reference numeral 10 in Figure 1) configured to receive and circulate the first optical signal (e.g. signal 12 at $t=0$ as described in column 3 lines 64-67) from the first input line (e.g. input line between reference numeral 14 and reference numeral 16 in Figure 1); a first frequency shifter (reference numeral 26 in Figure 1) connected in the recirculating loop (reference numeral 10 in Figure 1) and configured to frequency-shift the first optical information (e.g. first signal 12 becoming frequency shifted signal 32; column 3 lines 61-64); and the recirculating loop (reference numeral 10 in Figure 1), further configured to provide a frequency-stacked signal (e.g. "frequency comb" of column 4 lines 5-9) by receiving and circulating the second optical signal (e.g. signal 12 at $t=1$ as described in column 4 lines 1-4)

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concurrently with the first optical information (e.g. “both signals” and “both frequencies” of column 4 lines 1-4). Jopson differs from the claimed invention in that Jopson fails to specifically teach that the first and second optical signals are information bearing signals. However, carrying information on optical signals is well known in the art. One skilled in the art, without departing from the spirit or scope of Jopson’s invention, would clearly have recognized that the optical signals input to the frequency shifting apparatus of Jopson could have carried information. Furthermore, one skilled in the art would have been motivated to carry information on the first and second optical signals input to the frequency shifting apparatus of Jopson in order to facilitate communication between the local transmitter and a distant receiver via the frequency comb of signals generated by the apparatus of Jopson. Moreover, Jopson teaches that the frequency shifting apparatus is for use in a data traffic control system or for data package management of an optical communication network (column 1 lines 15-20), thereby suggesting that the optical signals at the input to the frequency shifting device can bear information and can be used to form a frequency comb of signals. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that the optical signals input to the frequency shifting device of Jopson could carry information and be used to produce a frequency comb of optical information signals via the frequency shifting apparatus taught by Jopson.

Regarding claims 2 and 12, Jopson obviates the ability to carry information on an optical signal as discussed regarding claim 1, and further teaches the first frequency shifter (reference numeral 26 in Figure 1), further configured to frequency-shift the frequency-stacked signal (e.g. “both frequencies are shifted” of column 4 lines 4-5); and the recirculating loop (reference numeral 10 in Figure 1) further configured to integrate a third optical signal (e.g. signal 12 at $t=2$

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and the third carrier of the "plurality of optical carriers" in column 4 lines 5-9) into the frequency-stacked signal by receiving and circulating a third optical signal (e.g. signal 12 at $t=2$) at the first frequency (e.g. "particular frequency" of column 3 lines 49-50).

Regarding claims 9 and 19, Jopson obviates the ability to carry information on an optical signal and also teaches the apparatus of claim 2, further comprising a tunable filter (reference numeral 240 in Figure 2) operably connected to pass at least one of the first, second (e.g. frequency "B" selected from frequency-stack "A" in Figure 3), and third signal selected from the frequency-stacked signal.

3. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jopson (U.S. Patent No. 5,822,476) in view of Sasayama (U.S. Patent No. 5,506,712).

Regarding claims 10 and 20, Jopson teaches the tunable filter of claim 9, but differs from the claimed invention in that Jopson fails to specifically teach that the apparatus of claim 9, further comprising a detector and a laser, the detector operably connected to receive the information from the tunable filter and configured to modulate the laser therewith. However, an apparatus comprising a detector and a laser wherein the detector is operably connected to receive an information signal and modulate the laser therewith is well known in the art. Sasayama, in the same field of optical storage, teaches that an apparatus comprising a detector (reference numeral 20-1-1 in Figure 20) and a laser (reference numeral 20-1 in Figure 20) wherein the detector is operably connected to receive an information signal (e.g. packets "A B C" in Figure 20) and modulate the laser therewith (column 15 lines 57-67) is well known in the art. One skilled in the art would have been motivated to employ a laser and detector such as that taught by Sasayama in order to carry out an appropriate wavelength conversion to make an appropriate

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wavelength allocation (column 15 lines 50-56 of Sasayama). One skilled in the art could have expected reasonable success in implementing the detector and laser of Sasayama in combination with the device of Jopson since Jopson provides a single frequency optical output (reference numeral 103 in Figure 2) and Sasayama provides an input to the detector (reference numeral 20-1-1 in Figure 20) for receiving an optical signal. One skilled in the art would clearly have recognized that the device of Jopson (Figure 2) could have been combined with the detector and laser of Sasayama (Figure 20) in order to make an appropriate wavelength allocation for the single frequency optical output signal of Jopson according to the disclosure of Sasayama. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to couple the detector and laser taught by Sasayama to the output of the tunable filter taught by Jopson so that the detector receives the information from the tunable filter and modulates the laser therewith, thereby providing an appropriate wavelength allocation to the single frequency optical output signal of Jopson.

Allowable Subject Matter

4. Claims 3-8 and 13-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or fully suggest a second frequency shifter connected to re-locate the first optical information at the first frequency by shifting the frequency-stacked signal; and a third frequency shifter connected to re-locate the second optical information at the first frequency by shifting the frequency-stacked signal. Although Jopson teaches second and third frequency

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shifters inherent in second and third "COMB GENERATING DEVICE" (226B and 226C in Figure 4), Jopson also teaches that a tunable filter is connected between the first and second frequency shifter and the second and third frequency shifter. In disclosing the tunable filters (reference numerals 240, 242, 252, and in Figure 4), Jopson teaches that a single frequency of interest from the frequency stack (e.g. "B" in the stack "A" ; "D" in stack "C" ; "F" in stack "E" of Figure 5) is selected by the tunable filter and further shifted upwards or downwards by the frequency shifters inherent in the comb generating devices, thereby creating a new and distinct frequency-stack (e.g. stack "C" created from selected frequency "B" and stack "E" created from selected frequency "D" in Figure 5). In doing so, Jopson teaches away from the claimed invention of the instant application claims 3 and 13, which require that the frequency-stacked signal and not a lone frequency from the frequency stacked signal be shifted to re-locate the first and second optical information at the first frequency.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Agustin Bello
Examiner
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